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edition

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Get the Most out of Your Amiga IV

SPECIAL EDITION

AMIGA
FORMAT



Excerpts from **Get the Most out of Your Amiga IV**

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This book is provided free with the October issue of Amiga Format magazine.

It contains excerpts from **Get the Most out of Your Amiga IV**, the latest edition of the best-selling Amiga owner's guidebook. This 300-page book explains everything you need to know about how your Amiga works and what it can do, and comes with a disk containing specially-selected public domain and shareware software to further enhance your machine. The full book is available in all good bookshops, and direct from Future Publishing.

About Amiga Format

Amiga Format is the UK's best-selling Amiga magazine. With its blend of authoritative reviews, up-to-the-minute news coverage and expert technical insight, it has led the field since its launch.

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1 Programming

Cliff Ramshaw

Getting started

Computers are tools, designed to do what we want them to. More often than not this means running commercial programs which present us with a list of options via requesters and menus. These options are converted into an action to be performed, and the program makes the computer perform it.



Writing your own programs is a direct way of telling your Amiga what to do – you can make it perform any of the actions within its power.

So, learning to program gives you power over your Amiga, or rather the ability to use your Amiga's power more directly and effectively. But don't be fooled by what you may have heard – programming isn't difficult. In fact, at a basic level, it's very straightforward, no more complex than entering CLI commands.

What's involved

At the heart of your Amiga is a silicon chip called the Central Processing Unit (CPU). This understands and obeys a limited set of instructions. A program is an ordered combination of these instructions, each of which is to be carried out one after the other. The instructions themselves are short and crude, but in concert they can be very powerful.



Think of an old-fashioned piano player. It has a set of notes, like an ordinary piano, and each of these may be likened to a processor instruction. A single note doesn't count for much, but subtle combinations of them can create beautiful music.

A piano player isn't played by a musician, but receives its instructions from rolls of paper with holes punched in which represent a note. The roll is the equivalent of a program.

The metaphor isn't as strained as it may seem – early programs were stored on punched cards, as often shown in 60s spy movies, and the holes in the cards correspond to instructions. Now, programs are held on floppy disks, but the principle still holds – the instructions are stored as a series of electronic ones and noughts, the same as holes and no-holes.

The CPU's instruction set is very crude, and many instructions need to work together to create an appreciable effect. This is fine from an engineering point of view – the smaller the instructions, the easier it is to build electronic gadgetry to understand and execute them quickly – but not so good for the easily confused human. This confusion is exacerbated by the form the instructions take – they are just simple numbers.

Programming languages operate on a compromise basis: they are far from English, lacking all of the language's subtlety, but their instructions take the form of English-like words, each equivalent in power to many of the CPU's numerical instructions, making it easier and quicker to write programs with them.



One of the most popular programming languages is BASIC (standing for Beginners' All-purpose Symbolic Instructional Code). It was created in the 70s to help introduce the foundations of programming to students before they went on to study more complex languages.

Because of its simplicity, BASIC has become immensely popular with home computer owners. This

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in turn has caused it to evolve, until it is now much more than a mere beginners' language. There are few things you can do in another language that can't be done in BASIC, yet it's still easy to learn.



BASIC, like most languages, is a procedural language. This means that programs written in it define a procedure to be followed. The procedure consists of the program's set of instructions, to be executed in the order they appear.

Flow charts

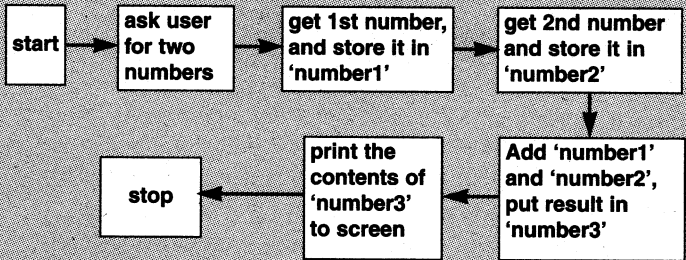
It's useful to represent this sort of program as a flow chart – a diagram showing each of the instructions to be followed, and in which order. Flow charts are valuable when you come to design complex programs – they help you envisage the overall flow of things before you get involved with the nitty gritty.

If you were to write a program to add two numbers together, you might break the procedure down to the following consecutive steps: print a message to the screen; get first number from the user; store it in memory; get second number from the user; store it in memory; add the two numbers in memory together and store the result elsewhere in memory; print the result in memory out to the screen.

Look at the diagram (above right) to see how this would be expressed as a flow chart.

Notice that the three numbers involved in the calculation have to be stored in memory. Generally, you as a programmer don't have to worry about the specifics of your Amiga's memory. Instead, you refer to areas in memory by means of variables.

Addition flow chart



This flow chart diagram represents a program for adding two numbers together.



A variable is an area in memory of sufficient size to store a single item of data – in this, case, a single number. The program gains access to data by referring to a variable name. A name might be something like 'number1'.

If you wanted to store a number in the bit of memory this name represented, then you'd write the name, followed by an equals sign, followed by the number to be stored. If you wanted your program to deal with the number held in memory, then you'd use the name itself. Here's how the program would look in BASIC:

```

PRINT "Enter the two numbers to be added"
INPUT number1
INPUT number2
number3=number1+number2
PRINT "The answer is ",number3
  
```

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The PRINT instruction enables you to print text and the contents of variables out to the screen. The INPUT instruction tells the Amiga to take whatever the user enters at the keyboard and store it in a variable, in this case first number1 then number2. The next line adds the two values held in number1 and number2, then stores the result of the addition in number3. The next line prints out this result, and the final line tells the Amiga there are no more instructions to be executed.



Completely linear programs like this are rare in practice. It's usual for the order of execution to be varied depending on the data a program is given to operate on. Two programming concepts in particular make this possible.

The first is decision-making. With it, a program can test the value of something – for example, testing whether a variable holds a particular number – and follow one of two courses of action depending on the result of the test.

The second is the idea of procedures. A procedure is like a miniature program, usually carrying out a more specialised task than a complete program. It need only be written once, but can be executed, or 'called', several times from different places within the same program. A common technique is to call a procedure if a certain result is yielded from a decision-making test.

Programming languages

AmigaBASIC

There are several variants of BASIC available for the Amiga. The original is AmigaBASIC, from Microsoft,

which, until a couple of years ago, was bundled with every Amiga sold.

In many respects it's a powerful language. It gives adequate, though not complete, support for the Amiga's graphics and sound facilities, and considerably extends the decision-making and procedure-calling facilities of BASIC.

It's not without its problems, though. AmigaBASIC won't take advantage of the AGA graphics modes or any of the Operating System improvements since Workbench 1.3 (after 1.3, Commodore bundled the language ARexx instead but didn't bother supplying any documentation).

It's also dreadfully slow. This would be almost bearable, but the editor that comes with it (all programs are entered as text from the keyboard, which is done with the aid of a text-editing program) is even slower, which makes developing programs with the language near unbearable. The final problem – something of a blessing, actually – is that AmigaBasic is no longer available. If you want to get into BASIC on your Amiga, look elsewhere.

AMOS

AMOS, from Europress Software, was originally intended primarily as a language for creating games. It provides much better access to the Amiga's innards, the hardware that makes all those wonderful graphics and audio effects possible, than AmigaBASIC. It does so with a simpler grammar, or syntax, and it does so much more quickly.

AMOS provides all the facilities you'd expect in a modern programming language, and has been used for writing games and many other applications,



most notably for educational software. It's a good, solid, straightforward language, easy on the beginner.

Europress released two variations on the original (known as AMOS The Creator and now no longer on sale). Easy AMOS and AMOS Professional. Easy AMOS (about £35), is aimed at the beginner, but comes with many extras, such as on-line help (click on a command to find out what it does and how to use it) a better-than-average manual and a debugging mode.

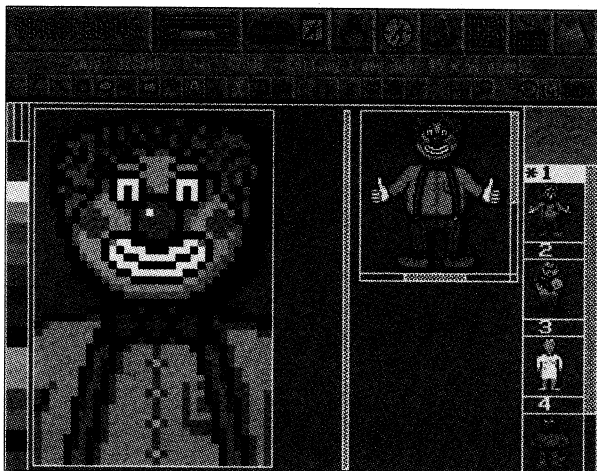
In debugging mode, you can force your programs to execute a single line at a time, with the ability to look at the contents of any variables in use. This is a real boon when it comes to removing mistakes from your work.

Easy AMOS is good, but AMOS Professional, (rrp £49.99, but given away on the Amiga Format issue 67 Coverdisk) is better.



Even as a beginner, you'd be advised to choose AMOS Professional over Easy AMOS. It has the same debugging features and a much larger and improved command set, making it a speedy, powerful language ready for just about any programming task.

Although AMOS is fast, it's still not fast enough to fulfil its original goal – to enable the creation of fast, arcade-style games. They require too many moving objects on the screen at once – try and animate a decent number of aliens in AMOS and things stagger along at a drunkard's pace. If you want to write this sort of game, you'd better look for something other than



AMOS Professional gives you flexibility and control over how you create characters, making it ideal for games programming.

BASIC. Or at least, that used to be the case, until the arrival of Blitz Basic.

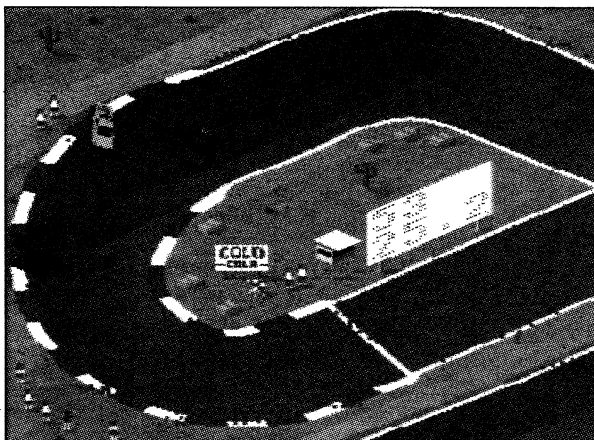
Blitz Basic



Acid Software's Blitz Basic 2 is built for speed. The only problem is that it's difficult to find a copy because it proved so popular, although a revised version should be out by the time you read this.

You still won't be able to write the more sophisticated kind of arcade games with it, but fast movement on a more basic level is certainly possible. A more-than-passable version of the arcade classic Defender is provided with the package, complete with zipping aliens and tremendous explosions.

1 Programming



Acid Software's excellent racing game, *Skidmarks*, was written in Blitz Basic 2. A new version of the programming language is on the way.

If Blitz is faster than AMOS, then it's also more complicated to grasp. Its syntax in places looks more like C than BASIC, making some commands a bit obscure. It does provide more power in raw programming terms than AMOS, though. One significant advantage is the use of records for grouping several related data items together under one name. It may not sound like much, but once you've been programming for a while you realise that organisation is the key and that being able to arrange your data like this is a must.

Blitz Basic has yet to become as popular as AMOS, but it's a great language, and if you want to write fast-paced games in BASIC, this is the one for you.

Assembler

Remember the numerical instructions that the CPU follows? These are what an Assembler language deals

with. Instead of referring to the instructions as numbers, you get to call them by cryptic, three or four letter words, and you can refer to areas in memory by assigned names (labels) rather than having to remember the numerical addresses.

But writing a program in Assembler is a cumbersome, error-prone business. You have to string so many instructions together, and you're dealing with the machine in such a raw, unbuffered state, that you're bound to make mistakes.



When you make a mistake in BASIC, the translator tells you and gives you a chance to correct it. If you make a mistake with Assembler, the Operating System will probably hold up its hands in horror and crash the Amiga.

So why do it? Speed, and control. Because there's no automatic translation involved (well, your three-letter words are turned into numbers, but that's it), because you're writing in the CPU's own tongue, there is no more efficient way to code a program. Every instruction, chosen by you, counts, so with Assembler you get the fastest programs of all.

Also, when a program is translated by something like a BASIC package, the translation needs to take into account certain generalities. A command you're using, for instance, may be able to act on more options than you are, at the time, concerned with.

Those optional extras need to be taken care of by the translator, even though you don't need them, and that takes time.

There's none of that nonsense with Assembler – you only write the instructions you need to be executed.



There are a few Assemblers available for the Amiga. A68K is a very good PD one, available from just about every library, and there are two commercial ones – DevPac 3 (about £70) from HiSoft and Macro 68 (about £130) from Helios Software.

Macro 68 is the more powerful of the two, but most people prefer the longer-established and more accessible DevPac 3. If you want to get into Assembler, you'll find both give you more than you need, but it might be advisable to start with A68K, just to see if you're suited to this style of programming.

C programming

BASIC is too slow, and Assembler is too error-prone, there must be a compromise, right? Well, there are many, but the most popular is a language called C.

Unlike BASIC, C's translation process is one of compilation rather than interpretation. With interpretation, the translator goes through each line of a program in turn, translating it and executing it. If, for some reason, execution returns to a line that has already been executed once, then it must be re-translated. It's inefficient, but it makes it easy for the programmer to correct mistakes.

With compilation, the program is translated en-masse before it is executed. The result executes much faster than its interpreted counterpart because no further translation is required. The downside is that the translation process can only pick up some of the errors in a program. The remainder, as in the case of Assembler, can cause anything from some mildly odd behaviour to a complete system crash.

commercial offering (a Coverdisk version appeared on *Amiga Shopper 47*).

DICE is a solid package with plenty of extras and it's likely that its author, Matt Dillon, will be more committed to the Amiga than SAS, a company whose primary concern is with other platforms such as the PC.

Other languages

There are plenty of other programming languages available for the Amiga:

Pascal is like a more academic version of C, with a clearer syntax and more easily-remembered commands. It hasn't quite caught on in the same way as C and the only commercial version for the Amiga is HiSpeed Pascal, from HiSoft. The rest are mostly available in the Public Domain, and as such tend to be on the ropery side and poorly supported.

The following sorts of languages have been designed for specific purposes:

Smalltalk is an object-orientated language, based on the philosophy that the data a program has to deal with is more important than the procedures that deal with it.

Lisp is a functional language - in which every instruction behaves like a mathematical function, taking arguments and producing results - designed for artificial intelligence research.

Prolog is also used for artificial intelligence. It relies heavily on formal logic, so programmers specify data and propositions about that data which may be either true or false. It can be used to solve the sort of logic puzzles that would be much more difficult to code in conventional language.

E is an Amiga-only language that's best described as a lean and mean version of C.

2 Graphics

Marcus Dyson

Get the right image

For a while, the Amiga was right out there as the greatest graphics machine available for the home user. Even the humble A500 was as good as any micro-computer you could get in its day. Those days may be long gone, but the Amiga still can hold its own against the Mac or PC in any area of graphics, and can beat them hands down in some disciplines.



A standard Mac or PC can only display images in up to 256 colours, a standard Amiga is capable of displaying images in up to 262,000 colours which enables even a basic A1200 to display images of almost video quality.

Computer graphics break down neatly into three basic areas; bitmap graphics, 3D, and image processing. So we'll look at each separate area, and see what you can expect to get from each, and what programs you'll need to achieve these results. But before we begin, we need to know a little bit about how images are displayed on a computer screen.

The data required to display the picture on a computer screen is kept in an area of RAM. Whatever is stored in this area, at any time, is interpreted by the Amiga and displayed on your monitor or TV. More colours require more memory, as do higher resolution pictures, we'll explain why in a second. And as the colour and resolution of the image increases, so too does the power of the processor required to display these images.

In the Commodore range, the original Pets had mono screens. The Vic 20 could display four colours, the C64 had a 16-colour display, and the early Amigas could

show 32 colours. Now Amigas can display up to 256 colours. If we look at this history, we can see a pattern developing. Two colours, then 4, 8, 16, 32 and so on.

Because the data for a screen display is stored in binary form, the numbers of colours that can be displayed are binary numbers. Each pixel on screen has an area of memory which is used to store its colour information. If this area of memory is one bit (one binary digit, a one or a zero), that pixel can be either black or white.

The bit is either on or off. Add another bit, and you can display four colours, another bit gives you eight, and so on. So each pixel has its own little area of memory (measured in bits), so the screen is a map of all these bits - a bitmap.



The reason that 256 colours is such a popular number for computers to display is because it takes eight bits to store the information to display 256 colours. Eight bits is a byte and a byte is a convenient data chunk for programs to shunt about in memory.

But for the Amiga to move around 256-colour data, requires nearly twice as much work for the processor as moving around 32-colour data, which is why an A1200 running in 256-colour mode is not noticeably faster than an A500 running in 32 colours, despite its more powerful CPU.

Bitmap graphics – paint programs

Programs which use bitmap graphics are usually called paint programs. They range from the very simple, to the hugely complicated, but they all have one thing in common, they store the image you create as a

bitmap. There are disadvantages to this format, and we will take a look at those later.



Paint packages use drawing methods that most people are familiar with in real life. A good paint package emulates, in both its methods of working and the names used for its functions, normal artistic media. For this reason, anyone can use a computer paint package.

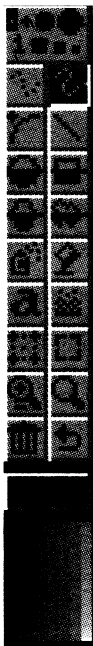
Virtually all paint programs are based around a similar set of functions, usually arranged in a menu bar, or icon palette like the one on the left from Personal Paint. It contains the basics of computer painting – at the top is the brush palette, which enables you to select different sizes of 'brush' with which to make your mark.

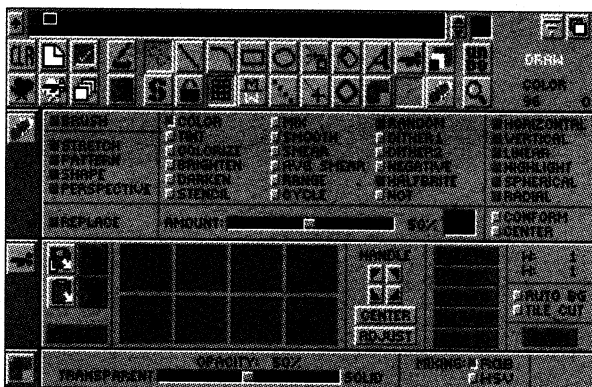
Below that are the simple drawing tools. These functions include the freehand line drawing tools, and a number of features to simplify the drawing process. There's also a tool to draw straight lines (no matter how shaky your hand) and other tools to draw perfect ellipses, circles and rectangles. Then there are tools to emulate an airbrush, and a paint-can tool to fill any area of the screen with the currently selected colour.

Paint programs have a host of features to make drawing actions that are quite tricky on paper easy on the Amiga.

Most people get a paint package with their Amiga when they buy it. Originally, Deluxe Paint was the program of choice, nowadays it is Personal Paint. Both of these packages are excellent, and for most people, they will be sufficient for all requirements.

But if you get bitten by the Amiga art bug, here are a few other programs you might like to take a look at.





One of the things that is so brilliant about Brilliance is the ease with which the menus are called up and the flexibility they offer over paint functions.

Brilliance – Digital Creations



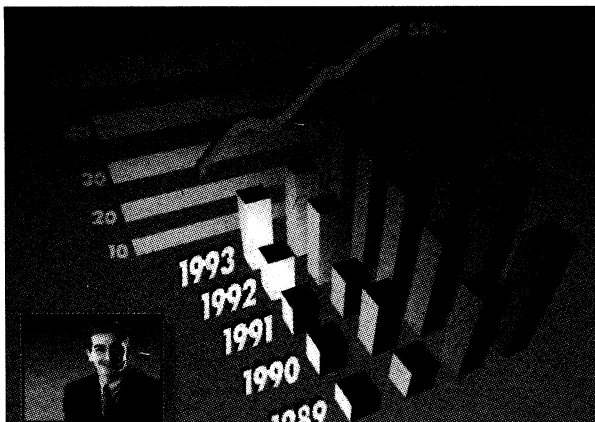
On the surface, Brilliance has little to offer that Deluxe Paint 4 AGA and the bundled version of Personal Paint do not. But when put to use, Brilliance reveals itself to be the finest paint package available for standard AGA machines. Its speed, features, and ease of use are unparalleled.

The Brilliance package is in fact two programs – Brilliance, a 256-colour register-based paint program, and True Brilliance a 24-bit paint package which uses the HAM-8 mode to display its stunning images.

TV Paint 3 – TecSoft

For the serious Amiga artist TV Paint is the only choice. The program used by many professionals, TV Paint is a true 24-bit paint package, and is available in

2 Graphics



The Rolls Royce of the Amiga painting world is TV Paint from TecSoft. It's a 24-bit card package and there are versions for every true-colour card.

a variety of different versions to support the 24-bit board you use. Its selection tools, brush-through modes, air-brush effects and much more make it worth a hefty price tag of over £299. It is often bundled with many 24-bit boards in a cut down version called TV Paint Jr.

SpectraPaint – PD

Didn't get a paint package with your machine? Want to try painting without the expense? Try SpectraPaint from the Public Domain. This PD offering has many of the features we have come to expect from commercial packages and, best of all, it only costs a couple of quid.

Structured drawing packages

Sometimes you need an image which has to be used repeatedly at different sizes. Bitmap packages are not

ideal for such purposes, because as the image is magnified, so are all the pixels which make it up, so if you enlarge a bitmap image too much you end up with a very blocky, or pixelated result. So you have to create your bitmap image at an adequate resolution for the largest size it will be used, and this can take lots of memory.

There is, however, a special kind of program, called a structured or vector drawing program which addresses this problem, but they are primarily used in DTP. Turn to the DTP section of this book for details.

3D modelling and raytracing



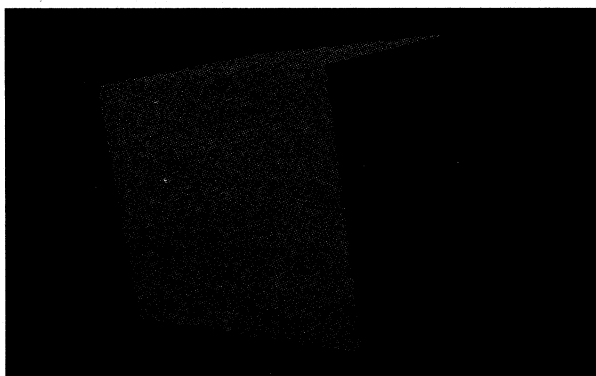
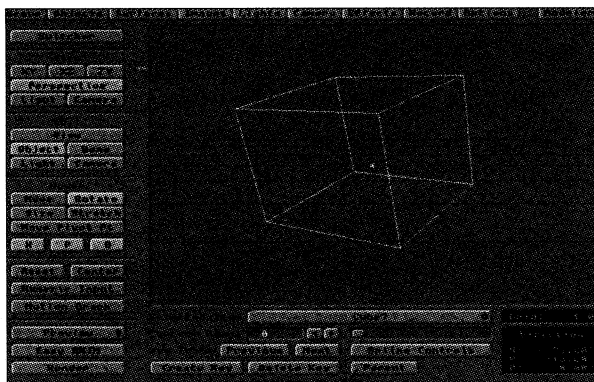
The most spectacular area of computer graphics is 3D. This form of graphics is a weird cross between the structured and bitmap graphics styles.

A 3D model is built by defining to the computer, in terms of sets of numbers called co-ordinates, the shape of an object. Simple objects like a cube can be defined in terms of 8 points, one for each corner.

Now, if we tell the Amiga that the sides of the object are filled in (that the object has faces) we can make the object appear solid. Then we can position the object (still in the virtual world of the computer's memory) relative to an imaginary camera, and one or more virtual light sources. The Amiga can then calculate what our scene would look like, and draw (or render) it for us. The Amiga traces all the rays of light that enter the imaginary camera lens back to their origin, that's why this kind of computer graphics is called raytracing.

But a nice cube floating in space isn't really a very attractive picture, or a very realistic one. What is our

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Simple three-dimensional objects such as this cube can be defined by a set of co-ordinates in a raytracing program.

cube made of? If we just render it as it is, it will appear to be made of white plastic. In fact, this was the problem with many early 3D images – everything looked as if it was made of hard, shiny plastic. The pictures looked very artificial, because everything in them was just too perfect.

It didn't take the scientists, theorists and developers behind 3D imaging long to work out why this was. Take a close look, and you will see that virtually every object has slight variations in colour across its surface, and most objects are bumpy, or textured. If 3D renders are to be realistic, they have to imitate the imperfection of real objects.



3D programs started to appear that enabled the user to map pictures on to the surfaces of objects. So if you wanted to create a wooden effect, you could get a bitmap image of a wooden surface, and wrap it on to your object.

Then they went one step further, and created bump mapping, so that you could use the bitmap image to alter the smoothness of the surface, as well as its colour. Virtually all modern 3D packages include these.

3D packages also enable the user to control many more characteristics of an object, like its specularity (how reflective it is) and its transparency. Making transparent objects is simply a matter of allowing the objects both to transmit and reflect some of the virtual light that strikes them. The Amiga has to calculate the physics laws of refraction as well as reflection.

But still the images, much more realistic now, were immediately recognisable as 3D raytracings. Something was still too good about the images for them to be true.

But the objects were not the cause of the problem this time, and neither was the lighting, which is reasonably easy to re-construct in a computer environment.

The problem was the way in which the computer 'took' the picture. Real cameras are restricted by the limitations of film speed and the laws of optical science. Which means all photographs have certain

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imperfections which we are so used to seeing by now, that images without them look false.

Because all photographs take some time to record (the duration of the shutter speed) anything moving in a picture is blurred – the quicker it is moving, the more it is blurred. This effect is called motion blur, but raytraced images lacked this subtle imperfection, a problem that was easily rectified by the addition of motion blur functions to all the top 3D programs.

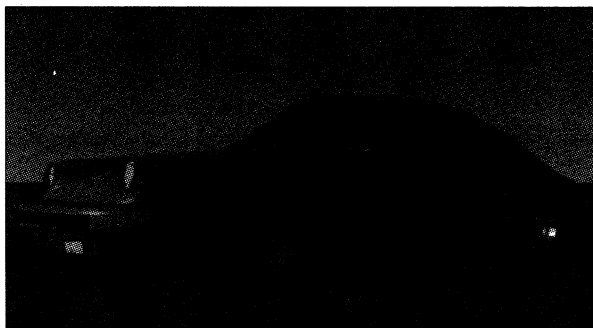
Which just left depth of field. When a camera is focused on an object in the middle distance, all the objects closer to the camera, or further away from it, are out of focus by an amount depending on their distance from the focal point.

This effect varies depending on the focal length of the lens, and the aperture being used by the photographer, but it is always present to some degree. But... you guessed it, early 3D packages overlooked this effect, and so even with their texture/bump mapping, and motion blur, the pictures still lacked that final element of realism.

But depth of field is easily calculable, and no sooner had the problem been identified than programmers were at their machines solving it.

Which brings us to the state of the art in 3D rendering. Now the only thing that can prevent a 3D image looking photo-realistic is the modelling skill of the user. But even here, good 3D packages lend a hand.

Imagine trying to create a computer model of your Amiga. All those keys. But when you have made one key, you can clone it to use as all the others. And those pesky function keys which are longer than the alpha-



There are many thousands on light rays bouncing around this picture of a Porsche so it can take even a powerful Amiga many hours to render it.

numeric keys? No problem, 3D packages enable you to bend, stretch, shear, twist and apply a whole host of other transformations to parts of your object.



If modelling proves too difficult for you, don't worry. There are thousands of models available commercially and in the Public Domain from which you can build your scenes.

In a scene like our imaginary cube floating in space, your Amiga only needs to calculate the paths of the light coming from our imaginary light source, hitting the cube and then bouncing into the camera.

So even an A600 can calculate it very quickly. But imagine that instead of our cube, we had a complex object like the model of a Porsche (opposite). All those polygons, all those different areas of different colour and reflectivity. In this case, there would be many thousands of light rays bouncing around the scene many hundreds of thousands of times.

2 Graphics

Performing the calculations for such a scene can take even a powerful computer a long time. Some of the prize-winning images from BitMovie, a large Italian computer graphics expo where the Amiga always wins many prizes, take over 24 hours to render, even on an Amiga 3000.



A standard A1200 is capable of rendering superb raytraced images, but in the interests of speed, it is better to install some Fast RAM, which doubles the speed of the machine. An FPU will further increase rendering speed since this chip is particularly helpful with the kinds of maths 3D programs use.

But why would we want to do all this 3D stuff anyway? After all, any idiot with an Amiga and Personal Paint can draw a cube, and with enough practice, there are many people who can draw an accurate Porsche.



The power of 3D, like that of structured drawings, is that all objects remain discreet, so we can re-arrange them and re-draw the scene as many times as we like, adding, deleting or moving objects as we feel necessary.

For this reason, once a number of objects have been created, it is easy to include them in complex and impressive animations. Still 3D images may well be impressive, but the first time you create a 3D animation, the feeling of achievement is incredible. 3D is also becoming more and more common in computer games, because powerful machines like the A4000 are far more capable of handling the calculations required to do real-time 3D. If you take a look at games like Ridge

Racer and Daytona USA in the arcades, you'll see what delights 3D games will soon be bringing.

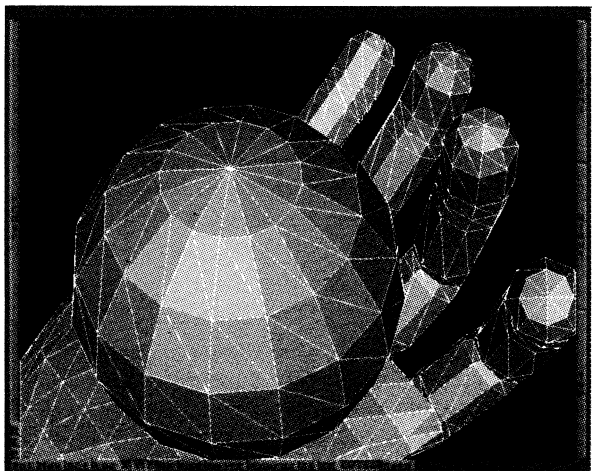
3D packages

Imagine 3 - Impulse

The latest incarnation of the Amiga's most popular 3D package is much more impressive than its predecessors, but also much more expensive at about £500.

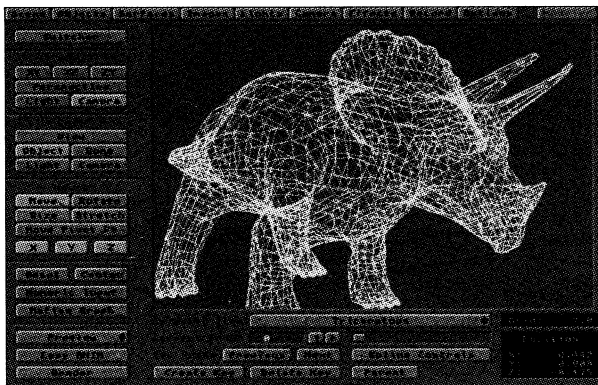
Already popular enough to be considered the Amiga standard for 3D, the new version has features which make it competitive with NewTek's Lightwave.

Imagine will also win many users through their familiarity with previous versions, and an excellent upgrade deal.



Imagine is one of the most popular Amiga 3D packages. Now in its third incarnation, it offers many features not available in other programs.

2 Graphics



Originally bundled with the NTSC-only Video Toaster package, Lightwave 3D is the most powerful 3D package on the Amiga.

Lightwave 3D - NewTek



Lightwave is possibly the most powerful and famous Amiga 3D package – it was used to create special effects in the television series Babylon 5 and SeaQuest DSV. It offers the user the ability to give images depth of field, motion blur and lens flare. Some of these features are even beyond those of the much-vaunted 3D Studio package for the PC, which costs over £2,000.

Lightwave was released at £600 and although you can find it for about £450, it's still expensive. But if you need the power and flexibility Lightwave offers, it's worth every penny.

Lightwave was originally only available as part of the Video Toaster video processor package, but it has now been released in a stand-alone version.

Real 3D V3 – Activa International

The first of the new generation, Real 3D was the first Amiga raytracer to offer soft shadows and motion blur. Real 3D differs from most raytracing packages in that it uses solid modelling instead of wire frame modelling.

There are benefits to both methods, and some professionals like to have both Imagine and Real 3D on hand, depending on the requirements of the job. Real 3D is superb for creating curved organic forms. It was also the first Amiga 3D package to offer depth of field.

It could be argued that Real 3D offers a lower spec than Lightwave, and it is less simple to use, but it is also considerably less expensive to buy!

Image manipulation

Once you have created an image, it is often necessary to alter it in various ways (such as compositing it with another image). To do this you need a program called an image processor.

An image processor allows you to make changes to a picture, either globally (to all the picture at once) or to selected areas of the picture.

These programs work by applying mathematical convolutions to your picture, which sounds tedious and complex, but the results can be as dramatic as adding lens flares to an image, or as simple as scaling a picture so that it can be combined with another.

Image processors can add colour where there was none, and convert to mono from a coloured picture. Some even let you edit your own convolutions, so that you can get virtually any effect you require. Here are some packages worth considering:

2 Graphics

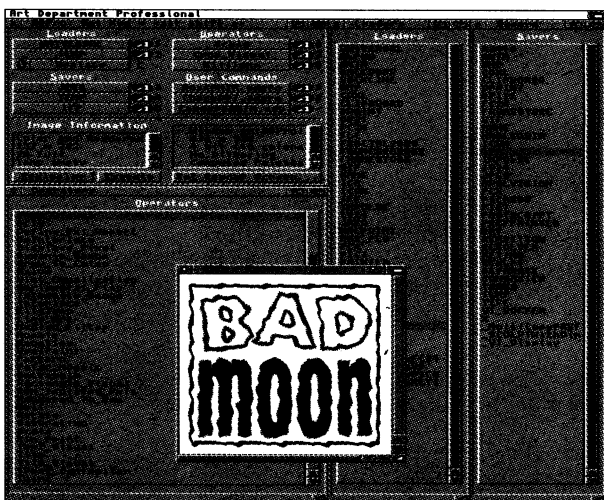


Personal Paint – Cloanto

You may not need an image processor until you get quite expert with graphics, but if you feel like giving special effects computer graphics a go, the first step is to get hold of a copy of Personal Paint.

This fairly normal paint package has some very impressive basic image processing functions built in. If they get you really interested you could then consider buying a dedicated image processing package.

Art Department Professional – ASDG



Art Department Professional is a powerful program, and with its new configurable front end, it's a joy to use.

The Amiga industry standard for image processing, Art Department is now on version 2.5 – which is much more than just an update of the previous version, but virtually an entirely new product.

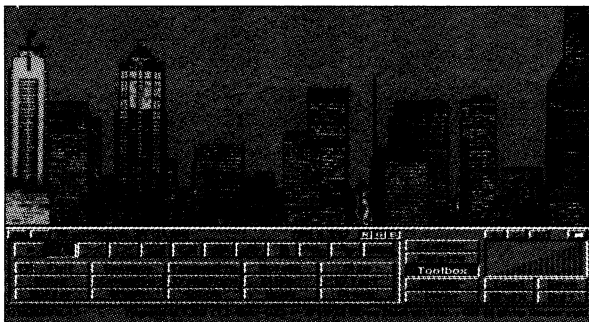
ADPro can load and save files in virtually every computer format in current use, and in between loading and saving them it performs a whole host of processing tasks.



The interface used to be a bit clunky, but the new user-editable front end really makes the program a joy to use. ADPro is supported by numerous third party programs which offer features such as batch image processing for animation usage.

ImageFX – GVP

A more attractive interface than ADPro fronts a package with very similar functions. ImageFX may lack some of the processing features that ADPro has, but makes up for this with the inclusion of basic painting functions.



ImageFX has pretty much the same features as ADPro, but it is a little more efficient in its memory requirements.

2 Graphics

The colour render window, which is visible virtually all the time, keeps you up to date with what is happening to your image a little better than ADPro's separate render screen system. Try both before you buy either. ImageFX is now on version 2, which costs about £200. However, version 1.5 is an excellent package and you may now be able to find it at a much-reduced price of about £100.

Image Master RT - Black Belt Systems

Difficult to obtain in the UK, Image Master RT is what the professionals recommend in the image processing stakes. If you are serious about buying an image processor, it may be worth checking out before you part with your cash.

Photogenics - Almathera

Although it can take a while to get the hang of, Photogenics is a remarkable program. It's fast, it's packed with features, although a couple of effects were missing from the original, and it's incredibly good value at £55.

Photogenics can be used to compose, scale and image process pictures, saving them out in any number of formats. And unlike most art packages, you can run multiple documents, making more complex operations a lot easier. Truly a very wonderful package.

3 Desktop publishing

Marcus Dyson

Getting started

It should come as no surprise to you that your Amiga is a capable performer in the field of desktop publishing. After all, is there anything Commodore's wunderkind cannot do? It may come as more of a surprise to some owners to discover what DTP (desktop publishing) is all about.

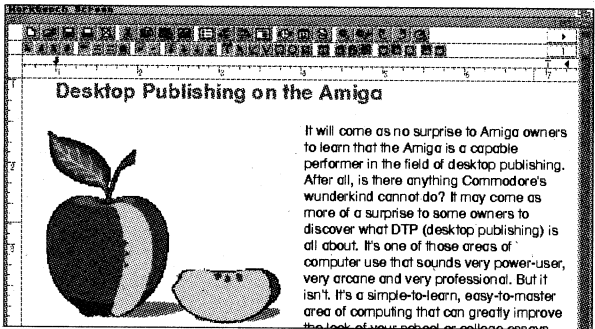


DTP is one of those areas of Amiga use that sounds very power-user, very arcane and very professional. But it isn't. It's a simple-to-learn, easy-to-master area of computing that can greatly improve the look of your essays, your company reports or even your party invites.

Sure, the name desktop publishing is very grand, evoking images of large faceless companies, holding the front page and stopping the presses. But in reality, DTP is nothing more than a way of getting your printer to do more than just output lines of text. And if you want to take it further, DTP can even be a career in itself.

Books like the one you are reading now, and magazines such as Amiga Format and Amiga Shopper are put together by designers using desktop publishing technology. But as we said, all DTP programs really do is control your printer in a very sophisticated way, so that instead of just printing out text documents in their resident fonts, your printer can use any one of many fonts. In fact it can even combine a number of different fonts in one document.

Hey, so some word processors can do that these days. But DTP programs enable you to import pictures



Advanced word processors are fine for many people's DTP needs. Check out Final Writer (above) or Wordworth before blowing £300 on PageStream 3.

into your document and print those out too. But some word processors can do that as well, we hear you cry.

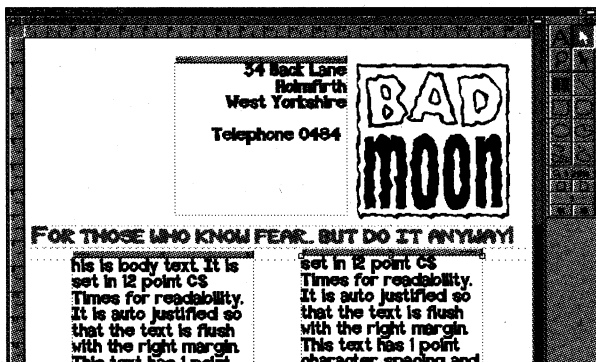


What differentiates a word processor program from a fully-featured DTP package (and it is getting a bit difficult to tell some of them apart) is the level of sophistication that DTP programs bring to the handling of text and graphics.

Whereas a word processor usually places text on a page, then formats it to look better, most DTP packages are frame-based. This means that before you can place either text or a picture on a page, you have to create a box to put it in.

This box then controls the area of the page the picture or text (we will refer to both these items as page elements from now on) occupy, and the orientation of the page element. This means that we can have text placed at angles to other text, and we can use boxes with borders, coloured backgrounds or even pictures as backgrounds.

3 Desktop publishing



DTP programs (unlike word processors) usually work on a box system. Each graphic or block of text must have a box defined for it to exist in.



It all sounds terribly complicated, but it's not. The results that can be obtained with even a modest DTP package can transform your printed output, and if you run a club magazine or newsletter, DTP offers you the opportunity to produce professional looking results on a budget.

If you combine one of the more advanced DTP packages with a quality printer, and you can produce graphic designs of a professional standard.

What to look for

The features you require from a DTP package depend on what you want to do with it. If you are producing a two-page newsletter, with a few added graphics, you'll probably find that one of the more adept word processors will suit your purpose. As it will if you are just preparing long tracts of text.



Anything applied to a master page appears on all document pages. Check these items can be edited. If they can't get a different program.

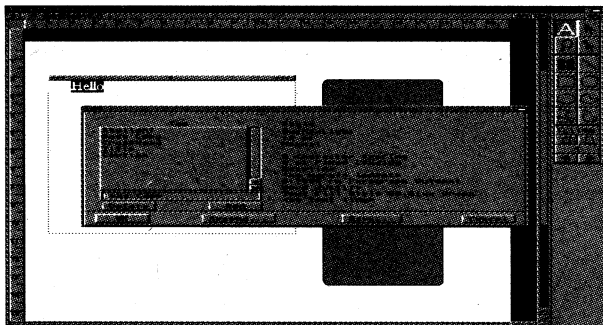


A desktop publisher is required once you begin to have specific design requirements. If you are writing or designing a book, check that the DTP package you intend to buy has good master pages.

A master page is a page you create at the start of the document. On it you place certain features such as the section head, titles, page folio and date, then when you come to add pages to your actual document, all these features are already on every page you add. A good DTP program should have a multiple master pages feature, so you can define several styles of master page.

Check also whether you can edit master page elements once they become part of your document. Some DTP packages don't let you do this, and if such programs don't have multiple master pages, they are effectively useless.

3 Desktop publishing



By setting up a style sheet for a document, you can make the repetitive task of formatting text a doddle.



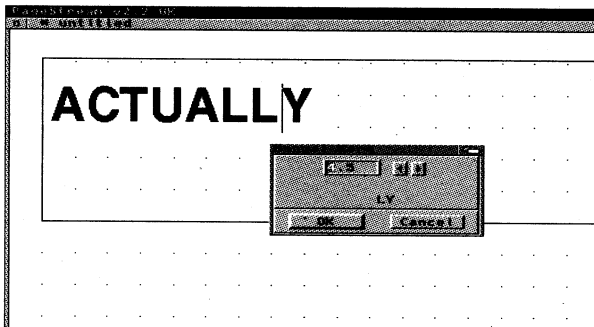
When working with lots of text, check to see if your DTP package supports the word processor package the text was created in. In some cases, you can then import the text pre-formatted – the DTP program retains the styles applied to the text in the WP.

If you have to import text without any formatting already applied, you need a program which works with styles or style sheets. This is a simple way of setting up a style for text, including the typeface, size, line spacing, colour and other features, by assigning the style to a function key, or some other key combination.

Then whenever you wish to format a piece of text in a similar way, you just highlight the text by moving the cursor over it, and press the relevant keys.



If your work is more typographic, that is to say, if you use less body copy, and more headlines, titles, and large type, you need a program with more refined text-handling facilities. These should include good control of leading.



Make sure your package has good typographic control. PageStream 2.2 (shown above) has both automatic and manual kerning facilities.

Your package should also have good control of letter spacing and kerning. Letter spacing is self-explanatory, but kerning, which is similar, is a little more difficult to explain. Certain letters just don't fit together well, even though they are used next to one another in the English language. A capital L and Y are a good example, if they are spaced mathematically by a DTP package, the chances are it will get it wrong and they will look further apart than the other letters in the same word, making the word look typographically ugly. Some programs let you adjust the kerning of given letter pairs to prevent this sort of thing happening.

Of course, if the package can't offer kerning control, but offers good letter space adjustment, you can get around this problem, but you have to independently edit every occurrence of the letter pair, whereas kerning control does it automatically.



Designers using more illustration in their work, for flyers, brochures and posters, need to look for a DTP program with better graphics handling facilities.

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Will the package allow you to crop images on the page? Some will not, and you have to crop your image in a paint or image processing package before importing it. Will the DTP package you have in mind rotate an image? If you are intending to colour print your final design, the quality of the output separations has to be considered too.

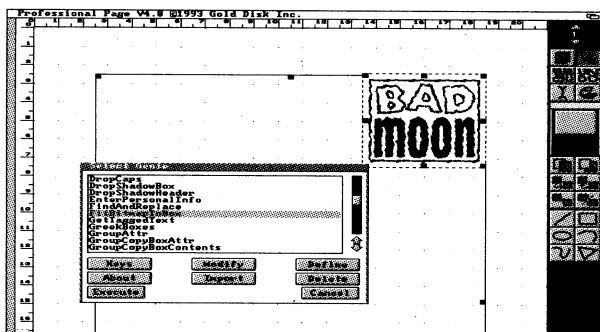


Which Amiga DTP packages should you look out for? There is a wide choice of DTP programs, but essentially, there are only three that should really demand your money.

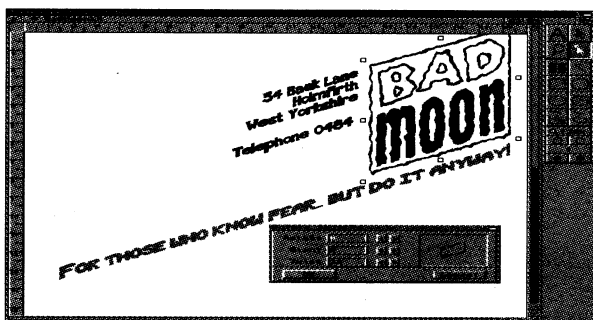
These are the ones to check out:

PageSetter 3 (Gold Disk) – This is the latest version of the first ever Amiga DTP package. Admittedly basic in its earlier versions, PageSetter 3 is unrecognisably improved in release 3. Not only does it support outline fonts and colour graphics, but AGA screenmodes are also on offer. You should be able to pick it up for about £50, a bargain price, making it the perfect introduction to Amiga DTP.

Professional Page 4 (Gold Disk) – PageSetter's big brother can claim to be the Amiga's first professional DTP package. In fact, right back in 1989 there was a Canadian magazine completely put together in version 1.3. The package has improved since then – it now offers all you would expect from a professional DTP program, including AGA support, and ARexx macros to make repetitive tasks simpler. The interface is still a little clunky, even on a hi-res multi-sync monitor, and Gold Disk are no longer actively developing for the Amiga market.



Professional Page was the first professional-quality Amiga DTP package. It now shows its age but is still a good program.



PageStream 2.2 (above) was fine, but there were teething problems with version 3. These have been addressed and it's now up there with the best.

PageStream 3 (Soft-Logik) – When the first versions of this long-awaited package appeared in the UK, they were a big disappointment and got a paltry 22 per cent rating in Amiga Format. The problem was that PageStream 3 was bugged. Badly. But revisions and upgrades have since been released which go a long

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way towards meeting PageSetter 3's claims to be as good as the industry standard package – Quark XPress.

Once you've got an Amiga, a DTP package and a printer, you can get started, although some extra RAM would make everything a lot quicker and easier.

Structured drawing packages

There are some things that DTP packages simply cannot do – bend text around the circumference of a circle, give text a coloured border and a graduated tint fill, and the like. In this case, a designer's best friend is a structured drawing package.

These programs use maths, not bitmaps to store picture information, and so whatever size you choose to print out your picture, a structured image always prints at the best resolution the output device can offer.



Structured drawing programs are ideal for situations where you want to use the same logo huge on the front of your newsletter, and then tiny on your business card.

Structured drawing packages are not as easy to use as paint packages, but once you get the hang of them they are extremely handy. Here's what is available:

Professional Draw (Gold Disk)– As if to underline the particular partnership between DTP and structured drawing packages, Gold Disk make this as a logical companion to their esteemed ProPage program. It shares the interface, and if you choose ProPage, it is the logical choice. It was lost in Gold Disk's desertion of the Amiga before it was ever upgraded to AGA, so it looks a little lacking by today's standards. But remember, although this package doesn't display in AGA, it is



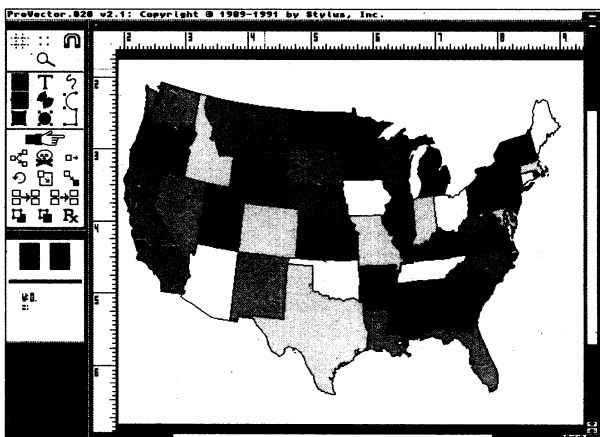
Designed to work alongside ProPage, ProDraw is a great package, but it needs updating to AGA to keep up with Art Expression and ProVector.

still capable of producing images that use all the colours your printer can handle.

Art Expression (Soft-Logik) – The intended companion to PageStream, Soft-Logik have produced a worthy, but uninspired structured drawing package. Worth looking at if only for its hot links to PageStream, which enable you to edit a logo in Art Expression, and it automatically transmits the changes to PageStream. Not a bad program, but one suspects that Soft-Logik may have been better off devoting their time to completing PageStream 3.

ProVector – The best way to get the hang of structured drawing is by getting Amiga Format 58 which carried a full version of ProVector on its Coverdisk. Also included was a demo of ProVector 3 which looks

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Despite having a slightly quirky user interface ProVector is an exceptionally fine structured drawing package.

like being the ultimate in Amiga structured drawing. It should be on sale by the time you read this.

Fonts

Most DTP programs come with a handful of fonts. But the chances are, you'll outgrow them. The standard fonts are ideal for ordinary work, but there will come a day when you want to use something a bit special. When that day comes you'll be glad to know that there are thousands of fonts available, both commercially and in the Public Domain.

You can get any font from a nice serif font like Baskerville through close replicas of Volkswagen-Audi's font, right up to Klingon. Yes, the Star Trek Klingon, it's a language, and it has its own fonts.



There are two types of font, bitmap, and outline, and they differ in exactly the way bitmap and structured images do. But because you frequently need to increase the size of fonts, bitmap fonts should be avoided at all costs.

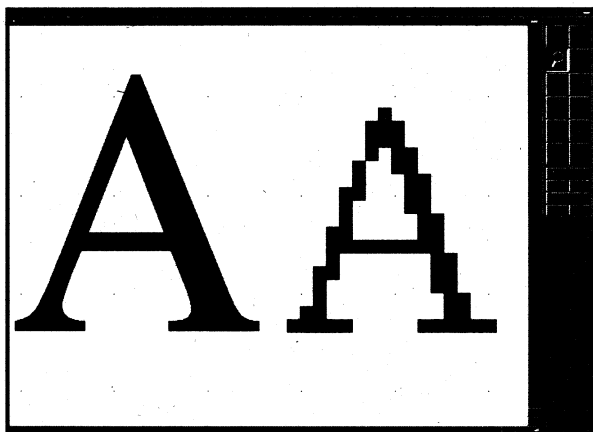
If you can't find the font you need anywhere else, you can always make it yourself. TypeSmith from Soft-Logik is a very specialised type of structured drawing package which enables you to load in fonts and edit them, or create your own from scratch, then save them out in standard font formats.

Design tips

But don't you have to be a trained graphic designer to produce professional looking results? Obviously, if you've got an eye for design or some training, the chances are that your documents will look better, but there are some simple rules that, if followed, will improve your design style immeasurably.

- Don't get carried away. There is a frequently-used maxim in design colleges – less is more. Resist the tendency to go over the top with your design. Even though you have 60 fonts, don't be tempted to use them all on the same document. A magazine like Amiga Format only uses about five fonts.
- Make it easy to read. There are two words which people frequently confuse – legibility and readability. Legibility is to do with how easy it is to make out the characters of a font at a distance. Heavy, sans serif typefaces are most legible. Readability is to do with how easy it is to read a large portion of a given typeface.

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See how the outline font (left) still looks good when enlarged, while the bitmap font becomes ugly and unreadable.

This is discovered in trials where the same piece of text is typeset in different typefaces and sizes and large samples of people are tested to see how quickly they read it, and how frequently they blink during reading it.



Light or medium-weight serif fonts are the most readable. Where it doesn't conflict with your design concept, use heavy sans serifs for headlines and titles, and try normal-weight serifs for body copy.

- Consider your measure. The measure is the length of the lines of text. Research has revealed that a good measure is between 1.5 and 2.5 lower case alphabets – a line should ideally be 40-65 characters long, including spaces.

Amiga DTP

It will come as no surprise to Amiga owners to learn that the Amiga is a capable performer in the field of desktop publishing. After all, is there anything Commodore's wunderkind cannot do? It may come as more of a surprise to some owners to discover what DTP (desktop publishing) is all about. It's one of those areas of computer use that sounds very power-user, very arcane and very professional. But it isn't. It's a simple-to-learn, easy-to-master area of computing that can greatly improve the look of your school or college essays, your company reports or even your party invites. Sure, the name desktop publishing is very grand, evoking images of large, feebleless companies, holding the front page and stopping the presses. But in reality, DTP is nothing more than a way of telling your printer to do more than just output lines of text. And if you want to take it further, DTP can be a career in itself. Books like the one you are reading now, and magazines like Amiga Format and Amiga Shopper are put together by designers using desktop publishing technology.

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It all sounds terribly complicated, but it's not. The results that can be obtained with even a modest DTP package can transform your printed output, and if you run a club magazine or newsletter, DTP will offer you the opportunity to produce professional looking results on a budget. Combine a more advanced DTP package with a quality printer, and you will produce graphic design of a professional standard.

What to look for! What features you require from a desktop publishing package really depends on what you want to do with it. If you are producing a fairly simple two page news letter, with a few added graphics, you'll probably find that one of the more adept word processors will suit your purpose. As it will if you are just preparing long tracts of text. A desktop publisher is required once you begin to have

Placing type on too long a measure can make it very difficult to read, so take care when deciding on a column width.



Longer lines lead to searching. When the reader finishes a line, and flicks their eye back to the start of the next line it is easy to miss lines, and lose the flow if the lines are too long because the eye has to travel back so far. If the lines are too short, they break the flow of the copy because the reader reaches the end of lines too frequently.

- Watch that leading. Even if you select the most readable font on earth (Times New Roman, or New Baskerville are likely contenders) and set it on a measure of 55 characters, you can still render it almost unreadable by having too little leading. Leading (pronounced ledd-ing) is the typographic word for line spacing. Some DTP packages use

3 Desktop publishing

Amiga DTP

- **Resist the tendency to go over the top with your design.**

Even though you have 80 fonts, don't be tempted to use them all on the same document. A magazine like *Amiga Format* only uses 5 fonts in an issue.

- **Make it easy to read.**

There are two words, which people frequently confuse, to do with a piece of text - legibility and readability. Legibility is to do with how easy it is to make out the characters of a font at a distance. Heavy, sans serif typefaces are most legible. Readability is to do with how easy it is to read a large portion of a given typeface. This is discovered in trials where the same piece of text is typeset in different typefaces/sizes and large samples of people are tested to see how quickly they read it, and how frequently they blink during reading it. Light or medium weight serif fonts are most readable. Where it doesn't conflict with your design concept, use heavy sans serifs for headlines and titles, and normal weight serifs for your body copy.

A simple way to create emphasis, even in mono, is by use of colour.

Simply reversing text out of a black panel gives it much greater presence on the page.

A good way for the mono DTP-er to attract attention to a piece of type is to box it out, either white out of black like this, or black type on a grey box.

the old word, some use the more logical line spacing terminology.



The simple rule for line spacing, is to give your text plus 20 per cent. So an 8 point face should be on 10 point leading. Most DTP packages do this by default, but there is sometimes a need to change leading. Too much leading looks bad, but is more readable than too little.

- Use devices. Now you have the power of a DTP package, there's no use doing things that you could do in a word processor. Think of all the lines, indents, curves, and other typographic devices you can now add to the page. Even simple devices like a black rectangle can be put to use to turn a mundane page into effective, design.
- Use colour. Now, some of you may be saying, 'I've only got a black and white printer', but that

Amiga DTP

● Resist the tendency to go over the top with your design.

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● Make it easy to read.

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● Consider your measure.

The measure of a piece of copy is the length of the lines of text. Scientific research like that mentioned in the last point, has revealed that a good measure is between 1.5 and 2.5 lower case alphabets. So a line should ideally be between around 40 and 55 characters long, including spaces. Longer lines lead to searching, when the reader finishes a line, and flicks their eye back to the start of the next line, because they have to travel back so far, it is easy to miss lines, and lose the flow of the text. Shorter lines break the flow of the copy because the reader reaches the end of lines too frequently.

● Watch that leading.

Even if you select the most readable font on earth (Times New Roman, or New Baskerville are likely contenders) and set it on a measure of 55 characters, you can still render it almost

Try using simple paragraph formatting techniques like these bullets. They may be simple, but they are an effective way of punctuating text.

doesn't matter. There are probably a good 10 levels of black that you can print. Bring emphasis to certain paragraphs by making the background black and the text white. Experiment with placing text on a light grey tint.



Use pictures. A picture does not say a thousand words, whoever contested that they did was obviously an artist and not a writer. But they do add visual interest to a page, and can attract attention to an accompanying piece of text. DTP packages can use pictures in many interesting ways, don't waste that power.

- Consider your justification. Justifying text means deciding whether the column has a straight edge at the left (called left ranged), which text com-

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monly does, at the right (right ranged), which it sometimes does, or both (justified). Justified text can look nice and neat, but it can also cause rivers – areas of white running down the page where the word breaks on several lines align. If this is turning into a problem, left ranged text can look friendlier.



You can also centre text, but try to avoid it. Non-designers tend to centre everything, because it makes it look symmetrical. It also makes it look awful. Unless you have a very good reason for doing it, avoid centering text.

- Prioritise. Use the power of typography to create a priority on the page. Using bold headlines at a large point size makes them the first thing a person reads when they look at a page. You can steer a reader around your document, making them read the elements in the order you want.
- Break the rules. If you want to do something different, spectacular or eye-catching, you are going to have to break at least one, and probably all of the above rules.

Planning a publication

There are just a few simple steps to take to be able to produce your own professional-looking documents.



Firstly, plan your publication. Work out roughly how many words you want to print. Then, taking account of the paper size and how large you want the text to be, calculate roughly how many pages you need.

If several people are writing the text, gather it all together, and word count it. Most decent word processors have a feature which tells you how many words a file contains. Then use your word processor's spelling checker to look for any typos in the copy. Be sure to print it out and proof read it too.



Spelling checkers easily miss simple mistakes such as using the word threw instead of through, or its instead of it's because they are not wrong spellings, but the wrong word.

Now create a simple flat plan – a sketch of all your pages, with a little note saying what you want to get on each. If you are working with more than four pages, a flatplan is a great help. It stops you laying out all the pages and then finding you have a piece of text with nowhere to fit it.

Remember to plan an even number of pages if you are using both sides of the paper to print on. And if you are going to fold and staple it like a magazine (A3 paper folded to give an A4 publication for instance) the number of pages will have to be a multiple of four.

If you don't have the right amount of copy to fill an appropriate number of pages, you will have to apply your editorial skills, and either cut out some of the pieces, or write them up so that they take up more room.

Now it is time to begin the layout. First, you need to create your master pages, telling your DTP package what size your document is going to be, and create any column design that is going to be common to all the pages.

Now you're on your own... Have fun!

3 Desktop publishing

4 Desktop video and multimedia

Damien Noonan

What is desktop video?

Actually, desktop video (DTV) is rather a misleading term. It started being used at about the same time that the phrase desktop publishing became popular, and it loosely describes any video process with a computer involved.

The big difference is that in DTP the computer replaces all sorts of traditional processes and equipment, but in video it can't. Yet. The main process in video is editing, but when DTV became popular, that was something computers couldn't help with.

Instead of editing, then, the main focus of DTV is titling, captions, static graphics, animations and the like. All you need is an Amiga, a paint program and a little piece of hardware called a genlock: we'll explain all that shortly.

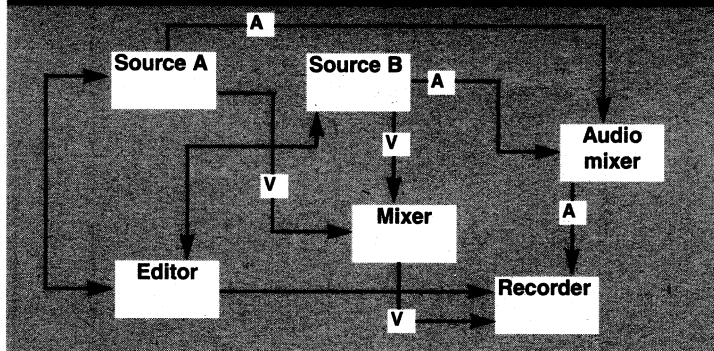
How video editing works

Before video came along, movies were all made with film. When you're editing film, all you have to do is cut out the bits you want with a pair of scissors and stick them together with Sellotape, leaving the stuff you don't want lying around on the cutting room floor.

Try cutting up videotape and you'd soon end up in a mess. Instead, what you have to do is play your source tape (or tapes) on a video player, and record just the bits you want on to a master tape.

In the diagram above right, there are two source players, player A and player B, so that you can mix from one video picture to another, and one recording machine which is used to tape the results and so record the master tape of the finished, edited production.

A video set-up



This simple diagram shows the relationship of the various items of video hardware. The 'A' signals are audio and the 'V' signals are video.

All the machines are controlled by an edit controller which operates the usual functions of playing, recording, fast forward and so on. Because the players are mechanical, they can work slightly differently, and yet you need all the video signals to be perfectly synchronised, so the time base correctors are used to sort out all the video signals and make sure they're in sync.

The vision mixer is used to mix between the different video signals, either fading from one picture to another or producing special effects known as DVE (digital video effects).

The audio mixer is needed so that you can choose between different audio sources – you might want the soundtrack from one or other of the source tapes, or you might want to add sound from a separate recording, or a microphone, or you might want to add music or sound effects. The vision mixer can be used to

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choose any of these, and also to balance the bass, treble, and volume of the different sounds.

And finally, there's your Amiga. It's normally used for adding the following kinds of things:

- Titles at the start of a video.
- Credits at the end.
- Captions on pictures.
- Animations to brighten things up.

Home video editing

At its simplest, you could play your source tape on a VCR or camcorder, and record it on another VCR, simply pausing the recording machine before and after the bits you want. The results this way are very rough and ready, and so it's called crash editing.



It's best to buy a simple edit controller – these are available in High Street electrical shops and vary in price from only about £100 to as much as £1,000. Many also incorporate a vision mixer or an audio mixer.

The edit controller takes control of the video equipment you're using, playing, recording and pausing automatically. In this way, the edit controller can give you edits that are accurate to about three video frames, which is three twenty-fifths of a second. Usually, it does this by two means: cable connections and infra-red controllers.



If you're even slightly serious about home video, it's worth buying a camcorder and a video recorder that are both compatible with the same kind of cable controller. There are two popular standards: Sony's LANC system, which is used by some other makes, and Panasonic's system, which is also imitated by other manufacturers.

Time code

To ensure that editing and measuring is completely frame-accurate, professional video systems use a time code. This system not only numbers each single frame on the tape (in the format hours: minutes: seconds: frames) but also controls the recording, so that it conforms to the frame exactly.

There are domestic camcorders and video recorders that use a time code, but the code is not as accurate as the professional systems. All the same, it's something that might influence your buying decision if you're serious about home video.

Home video formats

There are several different home video formats besides the basic VHS. It's worth remembering that different formats are not directly compatible, so if you have an S-VHS camcorder, you need both a video recorder and a television that have S-VHS inputs.



VHS and VHS-C are the basic formats. VHS is the dominant format that uses half-inch tape and a composite type of video signal, and VHS-C uses the same type of signal but on a compact tape, for camcorders.

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S-VHS and S-VHS-C are new, improved versions based on the same half-inch tape: Super VHS uses a greater resolution, giving a clear picture, and also the signal is of a type known as Y/C or luma chroma, which is of a better quality than a composite signal, because it separates the parts of the picture that control luminance (brightness or contrast) and chrominance (colour). Again, the S-VHS-C version, C standing for Compact, uses a smaller tape for camcorders.

Video 8 and the new, improved Hi-8 were developed by Sony and use compact 8mm tape, but both are also Y/C high-resolution systems like S-VHS. Hi-8 is currently the most popular system with most home video enthusiasts.

Buying a camcorder

There are a several important features you should look out for in a camcorder if you're buying one for the first time.

- Manual focus override: most camcorders focus automatically, but manual control enables you to compensate in situations where it might be fooled, such as reflections. You can also choose to focus in the distance before bringing a close-up subject into focus.
- Manual exposure: again, most camcorders do it automatically, but it's useful to be able to compensate for situations such as a strong light behind a subject.
- Controller compatibility: such as a LANC socket.

- A shutter: which divides the recording into proper frames.
- A zoom: to enable you to change the view without shifting the focus.
- Better Y/C format: such as S-VHS or Hi-8.

Buying a video recorder

There are certain things that will help if you're buying a new video recorder:

- Controller compatibility: such as a LANC socket.
- Freeze frame: modern four-head VCRs that have perfect freeze frame are bound to give a cleaner edit.
- A jog/shuttle control: this imitates the control system used by professional studio machines and make it much easier to whizz around your tape.
- Sound: stereo sound might be nice, and an audio dub facility gives you more options for putting down a soundtrack.
- S-VHS compatibility: this gives you extra Y/C quality, if you're using S-VHS or Hi-8 recording.

Your Amiga set-up

Buying a genlock

The one piece of hardware you need if you want to use your Amiga in a DTV set-up is a genlock. This is a

Our Adventure Holiday

Riding the White Water Rapids

Here's the Amiga title screen before you genlock a video picture into the background. The picture appears in the area filled by background colour.

Our Adventure Holiday

Riding the White Water Rapids

Here's the same title as the picture to the left with the video picture genlocked into the background colour.

device that mixes a picture from a video player into the background colour of an Amiga screen, so that anything that isn't the background colour on the screen stands out on top of the video picture.



There is an enormous range of genlocks available, varying in price from £50 to around £1,000. You judge a genlock on the quality of the mixed Amiga-and-video signal that it outputs, and the mixing features that it offers.

For a beginner, the simpler genlocks are a better bet. These have only a few switches and faders, so that you can choose from the following output signals:

- ☐ Amiga only.
- ☐ Video only.
- ☐ Amiga and video mixed.
- ☐ Fader, so that when you're on mixed signal, you can fade in the Amiga's graphics.

Which genlock?

The cheapest genlocks are the MiniGen at about £50, the MiniGen Plus, and the RocGen, but all of these produce a video signal that isn't really up to scratch.

Next you have the RocGen Plus (about £150) and the Rendale 8803 (about £170), both of which are good, but the latter has superior picture quality and is recommended. It's widely available in the high street, in Tecno camera shops. There is also a Rendale 8802 which is more or less identical except it's software-controlled and cheaper, but not as easy to use.

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Of the more expensive models, the G-Loc from GVP is a semi-professional model that's also software-controlled, so you can write A-Rexx control scripts to automate complex operations. There's a range from Hama of about three models, of which only the cheapest is worth ignoring, and G2 make a range of near-professional genlocks. Generally, you'd best stick to one of the cheaper models to start with.

Setting up a genlock

This is very simple indeed. The genlock usually connects to the Amiga's RGB Video port using a cable already attached to the genlock. All you then have to do is plug in three other cables:

- One input (from your video source to the genlock).
- One output (from the genlock to your video recorder).
- And one output to the Amiga's monitor which shows only the Amiga picture, not the mixed signal.
- You must also attach a TV or monitor to your video recorder to be able to see the mixed Amiga-plus-video signal.

If your genlock is working, you should now be able to fade the Amiga screen in to the mixed video signal and see your Workbench with a video picture genlocked in to the background colour. And that, incidentally, is pretty much how they do the on-screen pop-up information boxes for The Chart Show on ITV.

Simple titling with a genlock



Genlocks are very easy to use and you can produce your first titles in seconds. All you need is a paint program, such as Personal Paint or Deluxe Paint, running on your Amiga.

1. Make sure that the background colour of your picture is a neutral colour, such as blue or grey: you'll probably need white and black on your captions.
2. Use the text tool to select a size and style of type that you like: bold fonts are better than thin, straggly ones.
3. Type your title on the screen: try a pale colour first, such as white or yellow.
4. If you need to, you can pick up your title as a brush and move it around the screen. While it's a brush, you could also add outlines in black to help your title stand out.
5. If you want to, you could try putting a shadow on your title by picking it up as a brush, changing the drawing colour to a dark colour, stamping it down, then changing the colour to a paler colour again and stamping it down again (slightly higher and further to the left, but overlapping the darker version).
6. Now fade in your Amiga graphics and you should see your title over the video picture. Easy, eh?

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Basic titling hints



You can create simple animated titles with an animating paint program such as Deluxe Paint or Personal Paint – you don't necessarily need a special titling program. Try creating a page size that's twice as high as the screen and bringing your titles in from the bottom.

Scrolling titles are ones that run up the screen. Crawling titles are ones that move from the right to the left of the screen (never the other way, because you read from left to right). Use as large a size of type as looks reasonable to allow for smaller and worse-quality TVs. Don't put titles too near the edge.



Use pale colours, like white and yellow. Outlines or drop shadows in a dark colour will then help keep the titles separate from pale colours on the screen. Don't use bright red or blue. These colours 'bleed' and look a mess when recorded on a VHS tape.

Try using a small 'window' of background colour in a screen of Amiga graphics, so that the video picture appears only in the window. You can get some very original effects this way.



If you want your Amiga's graphics to disappear (bleed) right off the edge of the monitor screen, but not leave a border of video picture showing, you must use an overscan screen mode.

Use the Overscan Preferences program to position the Amiga's graphics on the video picture.

SHADOW OUTLINE

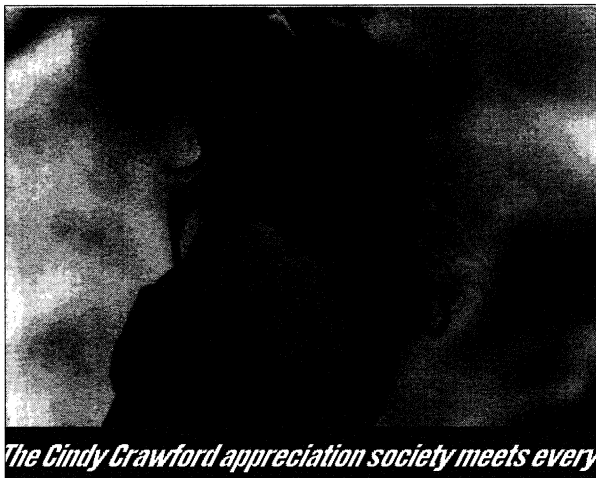
Drop shadows and outlines helps titles stand out. Try using combinations of colours for the shadow effect. Pale colours are generally more effective.

Holidays In
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Experiment with your titling: you can get a sophisticated effect by putting your titles on a vertical bar of solid colour...

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... and titles on a solid horizontal bar can be highly effective as well. You can achieve virtually any titling effect with a genlock and some imagination.



Try freehand drawing on top of your video picture for an amusing effect. Try putting captions on coloured bars along the bottom of your screen – it can look very professional.

Introducing multimedia

You generally won't have any reason for creating your own multimedia presentations, so we're not going to cover the subject in any detail: but just in case you would like to try your hand at it, we'll give you a brief idea of what it involves. The important thing is, it's really very easy.

What is multimedia?

Multimedia simply means presenting information using as many different methods as possible: text, pictures, sounds, music, narration, animations, video clips and so on.



A multimedia encyclopedia would have text and pictures in just the same way as a normal book, but you might also hear text being read out or difficult words pronounced

It might also have music if you look up Mozart, an animated diagram of how an engine works if you look up Internal Combustion, a video clip of Nigel Mansell winning a race if you look up Grand Prix, a recording of the 'fight them on the beaches' speech if you look up Winston Churchill, and so on.

Multimedia is usually thought of as a new medium that's related to books, and is usually associated with CD-ROM, because only a CD has sufficient storage capacity to hold all the pictures, animations and sounds that you'd need for a multimedia publication.

What you could use multimedia for



Apart from publications, multimedia is most widely used for touch-screen information systems in places like shops, where it's called point-of-sale, or museums and tourist offices, where it's referred to as point-of-information.

If you have a business that could make use of a system like this, it would be surprisingly easy and cheap to get it up and running. But on a simpler, level, you

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could use multimedia to create less ambitious business presentations too.

What you need for multimedia

The key thing you'll need is a multimedia authoring package, which is like a simplified programming language and is used to build all the material into a finished presentation.

That apart, you simply need the relevant applications to gather and prepare the material. For pictures, you need a paint program, scanner, video digitiser, and image processing program; for animation, an animation package; for sound, a music sequencer and sound sampler; and for text, you need a word processor.

Video is a little more tricky. For videos, Amiga CD-ROM uses something called CDXL, which uses compression techniques to achieve quarter-screen full motion video, but there is not currently a package available that you can use to create CDXL videos. A video digitiser that produces animated sequences of video grabs is your best bet.

How authoring programs work



There are generally two kinds of authoring package. One kind uses scripts full of typed commands, in a system that's very much like a programming language, and is therefore rather tricky to use.

The other, easier method uses a system of screens, so that you can set how one screen relates to another. For instance, you start off with one screen, and you place objects on the screen, such as pictures and text, until

you have a layout you're happy with. You can then define various areas of the screen as active, so that if the user moves the mouse button over that area they can click to make something happen. You might, for example, click to see an animation, or display a picture or text, or to go to another screen.

The latter kind of package is very easy to get to grips with and to use, which means you can concentrate your efforts on preparing the material – the graphics and text. But even the simplest kind of package involves using type-in commands to control operations, and you need a certain knowledge of the CLI.

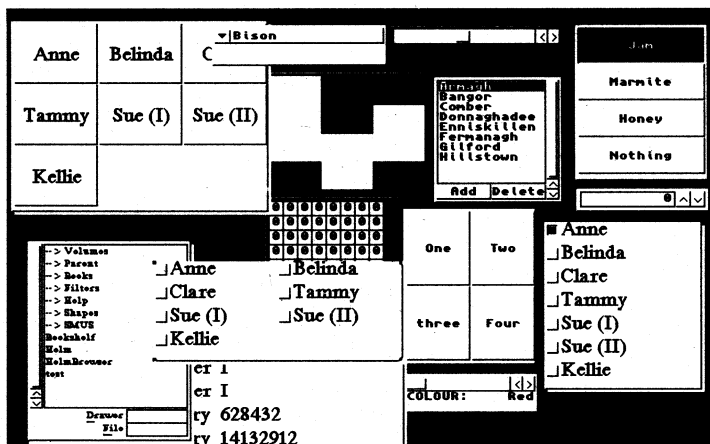
Choosing a multimedia package

Like so much else, the variety of software available for multimedia authoring has changed with the arrival



Version 3 of the CanDo multimedia authoring system was released early in '95. It's a great program for creating interactive information systems.

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Helm is a well-established multimedia package – probably the best one for the Amiga – and it supports AGA.

of the A1200 and A4000. You now need to have a program that supports the AGA screen modes and 256 colours is becoming a minimum standard for attractive multimedia presentations.

Older non-AGA packages, if you're content to work in 32 colours and HAM, can now be got quite cheaply. Two easy and effective systems are CanDo, which is powerful enough to be used to write complete applications, never mind multimedia presentations, and Hypercard, which uses a simple screen-by-screen approach based on the Macintosh's Hypercard system.

Of the newer AGA packages, two good bets are Helm and Interplay. The latter was used by Amiga Format magazine to create the CD-ROM disc for their special Amiga CD32 magazine, while the former is probably the best example of a multimedia presentation system that you can currently get for the Amiga.

Ideas for multimedia

There are certain conventions that have been established as good practice by multimedia programs during the early, experimental years of its use, and which are now widely accepted and used. Here's a few of them, which might help guide your own attempts.

Click/touch areas: the basic mechanic of multimedia interaction is moving the mouse pointer over an area and clicking on it to move on. This can be as simple as a button, but it's more interesting to use, say, a picture which the user can click on.

Cursor changes: so that the user knows which areas of the screen they can click on to make something happen, it's a good idea to have the pointer change to another shape – such as an arrow or hand – to show that an area of the screen is active.

Hypertext: very often, in a multimedia system, it's useful to have certain words in the text in bold, or coloured, so that they stand out. You can then set it up so that if the user clicks on one of these words, they are taken to an explanation of the word, or a related topic.

Go back: it's always useful, when you're using a multimedia presentation, to be able to return to the previous screen.

Search facilities: multimedia presentations very often contain a large amount of text, so it's useful to be able to search for references to a particular word.

History: many multimedia programs keep track of the screens you've visited, to make it easier to return to something you found interesting or useful.

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3D loosely any game or graphics program in which the pictures on the screen appear to be three-dimensional, but more correctly, games and graphics programs in which the pictures on the screen are calculated from three-dimensional mathematical models (known as objects). This method is used for realism-by, for example, flight simulation games.

Adventure a type of game in which the player takes on the role of an adventurer exploring a world, generally characterised by interaction with other characters and by thought and puzzle-solving, rather than speed of reactions.

Airbrush a tool in a paint program that scatters pixels of the current drawing colour in an almost random pattern, so as to imitate the action of an airbrush.

Alignment (also called justification) the arrangement of words on a piece of paper so that you have a straight line down the left-hand side (left alignment), the right-hand side (right alignment), or both sides (justified). Or, alternatively, neither side (centred).

Animation creating moving images by flicking through a series of slightly different screens (called frames).

Anim-brush a custom brush that features several or many different frames, just like an animation, and can be used to stamp down an animated image on a succession of animation screens.

Anti-aliasing a process used by many paint packages to avoid the jaggies, anti-aliasing shades in the edges of

diagonal lines so that the individual pixels look less obvious.

ASCII American standard code for information interchange, a standard file format for text used by all computers.

Autofire a system operated either by a button on a joystick or by a feature in a game, whereby a rapid, constant stream of fire is produced as if the fire button were being pressed repeatedly and extremely rapidly.

Background colour the colour that the screen becomes when you clear it.

Baud rate the speed at which a modem can transfer data, measured in bits per second (bps or baud).

BBS see Bulletin Boards.

Beat-em-up a game that involves fighting, often in a karate style.

BPS bits per second, see Baud rate.

Brush (custom brush) any tool with which you can draw on the screen in a paint program, and specifically the size and shape of the pattern of pixels that is drawn when you use the tool: but most commonly used in the sense of custom brush, which means an area of the screen that you cut out and can then draw with.

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Bulletin Boards remote computers to which you can connect using a modem. Bulletin Boards can be used to exchange E-mail, to swap news and views with other Amiga users, to play on-line games or to download Public Domain software. Also known as a BBS (Bulletin Board Service).

Bureau a service that you can send DTP documents to on disk, which can add in picture scans etc then produce image-set films.

Card index a type of database that uses an analogy with old-fashioned card index systems as a way of presenting the information on-screen.

Cel most commonly, a single rectangle from the grid of rows and columns in a spreadsheet.

Cel animation a traditional pre-computer style of animation that uses clear sheets of plastic (called cels) on which characters are drawn, so that they can be laid over a background painting.

Centred see Alignment.

CiX pronounced 'kicks', a popular mainstream commercial BBS.

Clip art drawings or pictures that you can buy ready-made and incorporate into your own pictures or DTP documents.

CMYK cyan, magenta, yellow and black ('k' stands for 'key'), the four colours of ink which are used in full-colour printing. By mixing different amounts of

these colours, you can produce any colour on paper, in just the same way that mixing red, green and blue light you can produce any colour on a TV screen.

Collision detection a process carried on by the program code in a game, which checks to see if objects on the screen have touched.

Colour separation the preparation of an image or a DTP page for professional, full-colour printing, by separating it into plates which represent the four colours of ink – cyan, magenta, yellow and black – which are used to print a full-colour page.

Compu-Serve a popular commercial BBS.

Custom brush see Brush.

Cut and paste to copy something from somewhere on the screen and put it in somewhere else. One of the most useful features of, especially, word processors.

Database a program that is used to store and retrieve information. You generally first set up a series of fields to store particular kinds of data (so in a name and address database, the fields might be surname, other names, address, town, postcode, telephone number) and you can then type in as many records as you wish, each record having different information but the same fields. Certain fields might be specified as key fields: these are the ones that you can search through to find a record you want, or

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sort in alphabetical order, or whatever (so in our address book database, the only key field would probably be surname).

Download to copy data from a remote computer or BBS by modem.

Drawing modes many paint programs have different effects that can be used when you start a drawing operation. The basic drawing mode is usually called Colour because it changes the pixels on the screen to whatever colour you're drawing with, but other drawing modes might, for example, smear the existing colours on the screen, or subtract the colour you're drawing with from those on the screen.

DTP desktop publishing, the use of a computer for traditional publishing tasks such as typesetting, design, layout and colour reproduction. The Amiga is an extremely capable DTP machine.

DTV desktop video, the use of an Amiga in creating videos, for instance to provide titles and captions.

EHB see Extra half-brite.

Em a measure used in printing, roughly the width of the letter 'm' in 12pt text.

E-mail electronic mail; messages left for you by another user on, for example, a BBS.

Em dash a dash (–) the width of one em.

En a measure used in printing, roughly the width of the letter 'n' in 12pt text.

En dash a dash (–) the width of one en.

EPS encapsulated PostScript file, a graphics file saved in a form that is standard for DTP programs and theoretically transferable to any other kind of computer.

Extra half-brite (EHB) special graphics mode on earlier Amigas which doubles the normal 32 colours available by supplying an extra 32 shades of exactly half the brightness, giving 64 colours in total.

Fax modem a modem that is also capable of sending and receiving faxes, which usually means that it has special fax software that you must install on your Amiga's hard disk drive. Faxes when received are generally stored as text or graphics data on your hard drive, not automatically printed out on paper.

Field see Database.

Filter in databases, a method of searching for just a particular type of data: in graphics programs, a system for changing the look of a picture or part of a picture by performing a mathematical function on it.

Fire (fire button) the button on the joystick, which is often used to fire a weapon in games.

Form in databases, a screen of data representing a record or the results of a search of records, which can be printed out. The form might contain additional

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descriptions that wouldn't be on the record itself.
Also called a report form.

Form letter see Mail merge.

Frame see Animation.

Frame rate the speed at which frames in an animation change, measured in frames per second (fps). TV images run at 25 fps but even professional animation will often get away with as little as 12 fps.

Freehand draw a tool in a paint program, and also the action of using that tool, where you can draw on screen in an unconstrained way as opposed to operations to draw straight lines, shapes etc.

Global any feature which applies across the whole of a program, not just to one aspect of the program – or across the whole of a file, rather than just to the bit you're working on.

God game a game in which the player has control over the lives and actions of a simulated race of people, such as Populous or Sim City.

HAM hold-and-modify, a special graphics mode which means that Amigas, which can normally use a maximum of 32 colours, can have 4,096 colours on the screen at one time.

HAM8 a variant on the HAM graphics mode for the newer Amigas with the AGA chip set in, which means machines that can normally use a maximum of 256

colours at one time are able to use over 65,000 colours on the same screen.

Horizontally scrolling a game in which the screen moves sideways so that the player's sprite moves across a background.

IFF Interchange File Format, the Amiga's standard file format used for pictures (and also sounds) so that pictures can readily be swapped between different graphics programs.

ILBM interleaved bitmap, a variation on the Amiga's IFF file format which is also used by some PC paint programs.

Image-setting a DTP term derived from typesetting that means producing finished colour-separated films; these are printed on an expensive machine, using a photographic type process, to give a quality that is sufficient for professional printing.

Internet, the a huge worldwide network of Bulletin Board services operated in such a way that the nearest system to you gives you access to all the other connections in the world without any extra phone costs.

Invisibles (invisible characters) special on-screen characters representing carriage returns, tabs and spaces in text.

Isometric an imitation 3D look used in games, where there is no proper perspective.

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Jaggies a term used to describe the effect of stepping or blockiness that is often apparent in a bitmap image – what should be a straight line actually looks jagged. Using higher resolutions and using anti-aliasing both help to prevent this effect.

Justification see Alignment.

Kerning the space between letters in DTP.

Keyboard shortcut pressing a key or a combination of keys as a quick alternative to selecting a menu option.

Key field see Database.

Leading an alternative to line spacing derived from typesetting, where in old-fashioned 'hot metal' type, a strip of lead was put beneath a line of text to hold it in place and space it from the next line. Leading, like type sizes, is measured in point sizes. You describe your leading as follows: the size of the type "on" the type size plus whatever extra you need for leading. So rather than saying "12 point type plus 4 points of leading", you would say "12 point on 16 point".

Left aligned see Alignment.

Line spacing derived from typing, used to refer to the gap left between each line of text, usually measured in half or whole lines that are left blank, each blank line being the same height as a line of text.

Listing a print-out or on-screen file of text that represents the code of a program.

Macro a program that controls other programs, or a function within a program that controls other functions within that program. Macros are a useful way of cutting down the excessive work caused by repetitive actions in a program.

Mail merge in a word processor you can often write a standard 'form letter', with areas such as name and address left blank, then print out lots of different versions featuring the names and addresses taken from a database.

Modem modulator/demodulator, a piece of hardware that can be plugged in to a telephone socket and converts data into signals that can be fed down the telephone lines. Using the modem, you can connect your computer to other computers, however distant, and then read and write data from the remote computer just as if it were a hard disk drive inside your own computer. People with modems often connect to Bulletin Boards or the Internet. Modems can be expensive to use because you usually have to pay a subscription fee to a Bulletin Board Service, and you have to pay phone charges all the time your modem is connected to a remote computer. For this reason, a faster modem is a good investment, so buy a modem with a high baud rate.

Multi-media software, very often supplied on CD-ROM, which uses all sorts of ways of presenting information: text, pictures, animations, sounds, music, video, speech and so on. A good example is a multimedia

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encyclopedia, which could have animated diagrams of how a car engine works, samples of jazz music, video clips of sporting records and so on to illustrate its entries.

Network a group of computers physically connected by wires, but also computers connected by modem links (see Internet).

Object-oriented used mostly to describe graphics programs, where the way the program works is concerned mostly with individual objects on the screen rather than the whole image. Usually this is because the program is structured, but there are also bitmap paint packages where individual pieces of bitmap are kept separate from the main picture and so can be moved and deleted without leaving a hole, which is not normally possible with bitmap images.

On-line connected to a remote computer via a modem.

On-line games games that you can play which are based not in your own Amiga, but in a host computer operated as a Bulletin Board. There is often a fee for on-line games based on the amount of time you play for.

Overscan the setting of the size of a picture, or a description of the area around the edges of a picture, which will normally disappear off the edges of a TV screen when the picture is displayed. It's particularly useful to use overscan picture sizes with video work, because it ensures that the picture will disappear off the edges of the TV screen.

Parentheses means the same as brackets (like this).

Platform game not a trainspotting simulation, but a game in which the player's sprite jumps between and runs along platforms on the screen.

Point sizes in DTP and WP but also anywhere you use text, the size of your text is measured in points (pt) – a meaningless, archaic measure derived from olde worlde printing. Point sizes are a little bit odd, because the same point size in different typefaces will appear different sizes: but you soon get familiar with what point sizes are reasonable for whatever kind of work you're doing. Normal book text like this, for example, might be anything from 8 pt to 12 pt, and on-screen text is usually 12 pt. See also Leading.

Preview a screen display that shows you what the finished result will look like.

Proof in DTP, a test page printed out (generally in black and white) that looks as close as possible to the finished thing, so that it can be checked (usually more for spelling than for looks). Also colour proof, which is a full-colour version of the same idea, used especially to check the look of pictures and check that the colours used work well together.

Record see Database.

Relational see Database.

5 Glossary

Report form see Form.

Repro (repro-graphics) a commercial operation that scans photographs and illustrations and incorporates them with typeset text to produce film for printing from.

Right aligned see 'alignment'.

Role-playing game an adventure game in which the player takes on the role of another person, within the game.

RPG see Role-playing game.

Rulers measures at the side of the screen in, for example, DTP or WP programs, that help you check the physical position (usually measured in inches or millimetres) of whatever you want to measure.

Shoot-em-up a type of game that involves shooting objects on the screen: usually a spaceship firing at aliens, or a war situation. It's the simplest type of game, derived from the first major arcade game, Space Invaders.

Simulation a game in which a real-world action is modelled, often represented by a 3D environment or accurate statistics, especially flying games, driving games and sports statistic or management games.

Spell checking word processing programs almost always have an internal dictionary and if you select the spell check option, can check through all the words you've written and check the spellings for you.

Spread-sheet a type of program used mainly for financial work, in which an on-screen 'sheet' divided into rows and columns can be used to note down figures and perform calculations on them.

Sprite an object on the screen, usually representing the player or an enemy.

Stencil a feature of a paint program that allows you to 'protect' either a particular area of the screen, or all pixels of a particular colour on the screen.

Structured (structured drawing) any graphics program in which objects on the screen are stored as mathematical models rather than bitmap images. Such programs are usually illustration programs of the kind used in DTP work, because images from them can be saved as EPS files and used at any size, just like scalable fonts.

Subscript letters that are smaller and below the usual base line of the lettering.

Super-script letters that are smaller and above the usual base line of the lettering.

Tabs short for tabulation, these are markers at the top of the screen with which characters in your text will align themselves when you press the Tab key.

Thesaurus a kind of dictionary found in many WP programs, which looks up alternatives for a word. Instead of 'now', for example, the thesaurus might offer 'currently'.

5 Glossary

Tool any function of a program that you choose in order to do a particular job: such as the straight line tool in a paint program, which you select in order to draw straight lines. Tools are usually selected by clicking on an icon, and tool icons are very often arranged in a toolbar.

Tracking the spacing out of the letters in a word or line in DTP.

Undo a feature of most programs, undo enables you to remove the last thing you did if it was a mistake: but you must not do anything else whatsoever before you use the undo.

Word processor (word processing) a type of program in which you use the Amiga almost as if it were a typewriter, except that the word processor is vastly easier because you can cut out bits of text, move them around, check the spelling of your words, and so on.

WP see Word processing.

WYSIWYG What You See Is What You Get, a description of any program in which the screen display is supposed to accurately represent what you'll see when you print out. So, for example, in a WYSIWYG word processor, the screen will represent a piece of paper, and where you place the text on the on-screen piece of paper should represent where the text is on the real piece of paper when you print out your document.

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